W42CF 1.3

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION X

EPA ID: WAD009041450 Site Name: Weyerhaeuser Co. State ID:

Alias Site Names:

City: Longview County or Parish: State: WA

Refer to Report Dated: 9/23/99 Report Type: Site Reassessment Report Lead: EPA

Report Developed by: E+E

DECISION: See Discussion/Rationale below

- ☐ 1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:
  - ☐ 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)
  - ☐ 1b. Site may qualify for action, but is deferred to:
- ☐ 2. Further Assessment Needed Under CERCLA:
  - 2a. Priority: ☐ Higher ☐ Lower
  - 2b. Other: (recommended action)

DISCUSSION/RATIONALE:

In response to the General Accounting Office (GAO) review of sites eligible for placement on the National Priorities List (NPL), but for which no final decision has been made [GAO backlog sites], a Site Reassessment of the above referenced site was conducted.

The Site Reassessment conducted includes the completion of a Site Status Review Report or review by an EPA Site Assessment Manager, a mini-Regional Decision Team meeting held on December 9, 1999, and discussions with State authorities.

Based on this Reassessment, EPA has determined this site to be a low priority for further assessment work under the Federal Superfund program.

The lead Agency for this site is WDOE (Ecology).

Site Decision Made by: Site Assessment Manager

Signature: Mark Allen Date: 9/13/00

Concurrence Provided by: Amber Wong Date: 9/18/00

Amber Wong, Unit Chief, Site Assessment & Cleanup Unit 2

MT

ecology and environment, inc.
International Specialists in the Environment

1500 First Interstate Center, 999 Third Avenue
Seattle, Washington 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

1.2

MEMORANDUM

To: John Meyer, EPA Region 10 Task Monitor

Thru: Linda Foster, EPA Region 10 START Site Assessment Manager

From: Julie Howe, START

Date: September 23, 1999

Subj: Site Status Review Report for Weyerhauser Site

Ref: EPA Contract No. 69-W6-0008
TDD No. 99-06-0010
CERCLIS No. ORD980665343

Introduction

The United States Environmental Protection Agency (EPA) Region 10 Superfund Technical Assessment and Response Team (START) contractor Ecology and Environment, Inc. (E&E), has been tasked by the EPA to conduct General Accounting Office (GAO) Site Status Reviews for Comprehensive Environmental Response, Compensation , and Liability Act (CERCLA) sites in Region 10 under Technical Direction Document No. 99-06-0010 for Contract No. 68-W6-0008. The purpose of this review is to determine the current status of these sites, and to determine what response activities, if any, have taken place since the last EPA site assessment or investigation.

Site Location and Description

The Weyerhauser Chlor-Alkali Plant site (CERCLIS No. ORD980665343) is located on the north shore of the Columbia River, near the city of Longview, Washington. The geographical coordinates are 46°7' 35.4" north latitude and 122°58' 32.4" west longitude. The site is a recently-closed chlorine and caustic production facility. From the 1950s to mid-1970s, it used a mercury electrolytic cell process to produce chlorine for Weyerhauser's pulp and paper mills. Leaks from pumps, valves, and process lines resulted in releases of mercury to on-site soils. In the mid-1970s, Weyerhauser converted to a different technology, and by 1976, mercury was no longer used at the plant. In March 1999, Weyerhauser ceased chlorine production at this facility.

Summary of Environmental Response Actions

The most recent EPA assessment, investigation, or evaluation of the site was a Level I Site Inspection Prioritization conducted by URS Consultants, Inc. in September 1993. Mr. Paul Skyllingstad from the Washington Department of Ecology (Ecology) Industrial Section was contacted by the START on July 17, 1999. He provided the following summary of recent site activities:

- In June 1998, a Remedial Investigation and Feasibility Study (RI/FS) Work Plan was approved and implemented.

- In April 1999, a draft RI Report was submitted.

- On August 5, 1999, Ecology approved the RI Report.

The RI Report summarizes the nature and extent of mercury contamination in site soils, groundwater, sediments, and surface water. Based on the results of the RI, a feasibility study will be conducted to establish remedial action goals and remediation levels for soil in order to protect the groundwater.

State Agency Site Contact

Paul Skyllingstad
Washington Department of Ecology
300 Desmond Drive
Lacey, Washington 98506
(360)407-6949

List of Attachments

CH_2M Hill Remedial Investigation Report, dated April 1999, (Executive Summary and Introduction only; the entire report is available from Ecology).

Letter from Ecology to Weyerhauser, dated August 5, 1999.

Ecology Draft

Remedial Investigation Report Chlor-Alkali Plant Longview, Washington

Volume I

Prepared for

Weyerhaeuser Company

April 1999

Prepared by

CH2MHILL

Contents

Executive Summary

This report addresses the remedial investigation (RI) performed for Weyerhaeuser Company's Chlor-Alkali Plant at its forest products complex in Longview, Washington. The location of the plant is shown in Figure ES-1. Chlorine and caustic were initially produced at the plant using the mercury electrolytic cell process in the 1950s. Concerns over potential releases of mercury into the environment prompted Weyerhaeuser to change methods for handling process wastes and convert to a different process technology (diaphragm cells). Environmental control systems were put into place in the 1970s. In 1976, mercury use in the plant processes ceased, as did releases to the environment. Because of the possibility of historical releases of mercury to the environment, Weyerhaeuser has conducted and continues to conduct comprehensive sampling of various media to determine mercury concentrations and, when necessary, to perform remediation of materials at the Chlor-Alkali Plant that contain mercury. On March 15, 1999, Weyerhaeuser shut down the chlorine production at this facility. Following decommissioning activities, the plant will be put into mothball status. No decisions about the long-term use of the site have been announced.

Currently the site is undergoing remedial investigation work as an independent action by Weyerhaeuser; this work involves collecting samples as prescribed in a work plan approved by the Washington State Department of Ecology (CH2M HILL, 1995). This RI report has been prepared per the directives in the work plan, in accordance with the requirements of the January 1996 Model Toxics Control Act (MTCA) (Washington Administrative Code [WAC] 173-340-350).

Purpose of RI Report

This RI report presents the findings of past and current investigations undertaken in potential areas of concern identified by Weyerhaeuser and Ecology (see Figure ES-2). Because there is a considerable amount of existing data on plant operations, site conditions, and mercury concentrations, as documented in the approved work plan (CH2M HILL, 1995), an extensive site investigation during the RI was unnecessary. Sampling conducted at this site has been comprehensive and provides a firm basis for remedial decisionmaking. Because much of the information required for the RI/FS by MTCA is already included in the work plan, the objectives of the RI report are focused on the following, per WAC 173-340-350 (1):

- To present the information collected during the RI
- To determine the extent and concentration of mercury in soil, groundwater, surface water, and sediment
- To evaluate the risk to receptors identified in approved work plan
- To provide information necessary to determine the need for additional remedial measures and to enable the selection of a cleanup action under WAC 173-340-360

Summary of Fieldwork

The collection of additional field data was proposed in the work plan (CH2M HILL, 1995) to address data needs and to further define the site conceptual model. Field investigation tasks were conducted from September 1998 through January 1999. Following are summaries of the fieldwork items performed during this investigation for soils, groundwater, sediment, and surface water. Also included is a brief description of the topographic survey that was conducted of the stormwater drainage ditch.

Soil

- Four soil samples were collected from the brine spill area to confirm the effectiveness of previous soil removal activities from a historical spill of depleted brine solution.
- Four soil samples were collected from the former surface impoundment area to help evaluate soil remedial alternatives in the feasibility study.
- Five samples were collected from the stormwater drainage ditch to determine the extent of detectable mercury concentrations in the ditch.

Groundwater

- Two alluvial-zone groundwater monitoring wells were installed at the Weyerhaeuser site upgradient of the Chlor-Alkali Plant to further characterize the upgradient (CH-7) and cross-gradient (CH-8) extent of mercury in groundwater.
- Two rounds of groundwater sampling were completed on deep and shallow monitoring wells located across the site to document the mercury concentrations, pH, and specific conductance in groundwater at the Chlor-Alkali Plant.
- Water levels in both the monitoring wells and the Columbia River were monitored for a period of 72 hours to assess the magnitude of tidal influences on groundwater in the basalt and alluvial zones.

Sediment

- Sediment samples were collected from the Columbia River adjacent to, upstream of, and downstream of the former diffuser associated with the former No. 1 Cell Room. The purpose of the sampling was to assess the extent of mercury in the river in the vicinity of the former diffuser.

Surface Water Sampling

- Flow measurements were taken and surface water sampling was completed in the eastern stormwater drainage ditch during three storm events at the discharge point to the Columbia River. The purpose of the sampling was to estimate the potential mass loading of mercury to the Columbia River via stormwater discharge.

Topographic Survey

- The stormwater drainage ditch and surrounding area were surveyed to delineate the topography of the ditch drainage and to determine the area at the Chlor-Alkali Plant that contributes runoff to the ditch and whether this includes the former surface impoundment area and former No. 1 Cell Room.

Nature and Extent of Mercury

Following are summaries of results of the data collection activities and discussions of the nature and extent of mercury, based on historical investigations and the field investigations described above.

Soils

The mercury in soil at the Chlor-Alkali Plant is inorganic mercury, which is believed to be present in soil at areas where releases are known or suspected to have occurred. These "potential areas of concern" were identified in the approved work plan and include the former surface impoundment area, staging area, former No. 1 Cell Room, No. 2 Cell Room, brine spill area, caustic storage area, loading area, liquefaction area, brine treatment area, and west area (see Figure ES-2). The following conclusions were made for each area:

- Concentrations of mercury are low (that is, less than 16 milligrams per kilogram [mg/kg]) in the west area, the stormwater drainage ditch, and—within the central process area—the liquefaction and loading areas.
- Concentrations of mercury are moderate (that is, less than 189 mg/kg total mercury) in the brine spill and brine treatment areas and—within the central process area—in the No. 2 Cell Room, brine treatment area, caustic storage area, and staging area.
- Mercury concentrations are the highest within the areas of the former No. 1 Cell Room and former surface impoundment area. These areas have undergone removal actions, and the area of the former No. 1 Cell Room is currently covered with a polymer-modified asphalt cap.

Five surface soil samples were collected from the stormwater drainage ditch and analyzed for total mercury. Concentrations of mercury ranged from 0.6 mg/kg to 4.8 mg/kg, with an average of 2 mg/kg. These results suggest that the soil in the ditch does not represent a significant source of mercury to the Columbia River via runoff.

Groundwater

Groundwater occurs in saturated portions of the alluvial and basalt aquifers at the Chlor-Alkali facility. The Columbia River, which borders the edge of the site, forms the base for the local and regional hydrologic systems. Groundwater beneath the site discharges to the Columbia River, and the river stage has only a minor influence on groundwater levels beneath the site.

In general, mercury concentrations in groundwater are either steady or decreasing with time; the rate of decrease is slowest in the area of the former No. 1 Cell Room and the former

surface impoundment area. Except for in these areas, mercury concentrations are at or below the federal primary maximum contaminant level (MCL) for mercury of 0.002 milligrams per liter (mg/L).

Potential explanations for the slow rate of decrease in mercury concentrations in certain wells include the following:

- The amount of groundwater flux (and therefore the rate of flushing) is limited because the asphalt cap reduces rainfall infiltration and because the transmissivity of the basalt and the alluvium is very low. Additionally, a considerable portion of the basalt surface was sealed with concrete during cell room demolition activities.
- It is possible that small amounts of elemental mercury may be present below the water table as isolated globules within basalt fractures. If present, these globules could serve as an ongoing source of dissolved mercury in groundwater.
- Although transient fluctuations in mercury concentrations may occur as a result of unusually high rainfall conditions, it is likely that mercury concentrations from the former No. 1 Cell Room and former surface impoundments will continue to decrease slowly over the future. Concentrations in groundwater are not expected to increase substantially with time because the initial mercury source was removed from the plant 20 years ago, and mercury in soil does not appear to be the source to groundwater. The results from soil and groundwater sampling suggest that leaching of mercury from soil to groundwater by infiltration and percolation of precipitation is not a major factor influencing mercury concentrations in groundwater; rather, the presence of mercury in groundwater is caused by rising groundwater levels (essentially those that occur during abnormally high precipitation events).

Mercury is not present in groundwater upgradient of the former No. 1 Cell Room and former surface impoundment area, as seen in sampling results of the new Monitoring Wells CH-7 and CH-8. Mercury was not detected in either well during the first round of sampling in 1998.

The mercury discharge to the Columbia River from groundwater is estimated to be approximately 0.6 pound per year. Essentially, all of this is discharged from the alluvium; the basalt zone contributes approximately 0.03 percent of this total.

Sediment

Mercury in sediment adjacent to the Chlor-Alkali Plant is either not present or is found in very low concentrations. Concentrations were above detection limits in only two samples (at 0.2 mg/kg), collected adjacent to the salt dock. The detected concentrations were equal to or lower than those found in background sediment collected during historical investigations. No mercury was detected in sediment collected near the former No.1 Cell Room diffuser. A second diffuser, associated with the No. 2 Cell Room, will be sampled to verify that mercury is not present or is found at very low concentrations at the Chlor-Alkali Plant.

Surface Water

All stormwater sample results from the eastern stormwater ditch indicated that mercury concentrations were below the detection limit of 0.0002 mg/L. There is currently no

mercury load to the Columbia River from this ditch. Based on these surface water results and the results from sampling soil within the ditch, stormwater runoff not captured by the stormwater treatment system is not considered to represent a significant source of mercury to the Columbia River.

Topographic Survey

A topographic survey was completed on the area surrounding the stormwater drainage ditch to determine whether the area of the former No. 1 Cell Room and the former surface impoundment area contribute runoff to the ditch. The survey and a visual inspection of the area during a rainfall event indicate that only part of the area actually drains into the drainage ditch; a portion of the area drains away from the ditch and gets collected in storm drains located near the ditch. Therefore, only a portion of the water from the area around the former surface impoundment area is discharged to the Columbia River through the stormwater drainage ditch. The area of the former No. 1 Cell Room is paved, and the stormwater is collected and then conveyed through the stormwater collection system.

MTCA Assessment

A Model Toxics Control Act (MTCA) assessment was performed per the requirements of WAC 173-340-700 to 760. A conceptual exposure model was revised from the approved work plan (CH2M HILL, 1995) and is included as Figure ES-3. At the Chlor-Alkali Plant, the land use is currently heavy industrial and will remain industrial. The most plausible exposure scenarios at the plant are as follows:

- Potential future occupational exposure to mercury in soil by incidental direct contact
- Potential future occupational exposure to mercury in groundwater
- Potential current or future recreational consumption of affected fish (that is, nonmigratory or semiresident fish) from the Columbia River

It is plausible that fish from the Columbia River could be consumed not just by recreational anglers but by ethnic subpopulations, such as Native Americans. There are no formally adjudicated fishing rights in the vicinity of Longview. Additionally, available information pertaining to actual fish consumption near the Chlor-Alkali Plant by these subpopulations is missing, and other available data (for example, Columbia River Inter-Tribal Fish Commission, 1994) do not allow quantitative characterization of possible exposure for these subpopulations.

Cleanup levels (CULs) were identified as shown in Table ES-1, and a comparison to site data was performed. The results of the comparison indicate that for direct contact with soil, none of the 95 percent upper confidence limit (UCL) exceeded the Method C CUL. Also, no exceedances of the 2x or 10 percent MTCA criteria were seen. However, most of the soil data exceeds the onsite-soil-to-protect-groundwater CUL of 1 mg/kg. For groundwater, concentrations in the central process area, former No. 1 Cell Room, and former surface impoundment area exceed the onsite groundwater CUL, although the site conditions that are represented by this CUL (that is, groundwater as a drinking water source) are nonexistent at this time and will remain so in the future.

Impacts from mercury in groundwater discharged to the Columbia River are best evaluated by examining the data from sediments, surface water, and fish tissue sampled from the river. In recent sampling events, mercury was detected only twice in sediments. However, none of the samples collected contained mercury at levels that exceed available sediment criteria. (MTCA CULs are not available.)

Mercury was not detected in surface water. The detection limits were low enough to provide assurance that mercury was not present at concentrations exceeding the freshwater acute AWQC, but not low enough to provide assurance that mercury was below the freshwater chronic AWQC.

Finally, although mercury can be detected in the tissues of aquatic organisms sampled from the river, the distribution of mercury in these samples does not indicate an association between the site and mercury in aquatic organisms. Also, mercury in tissues appears to be declining over time. Considered collectively, the data from sediments, surface water, and aquatic organisms do not indicate that the site (including groundwater discharging from the site) is producing a definable mercury problem in the Columbia River. It is not likely that attempts to reduce mercury concentrations in aquatic organisms by managing mercury at the site will produce an observable result, simply because conditions in the river cannot be associated with the site.

Conclusions

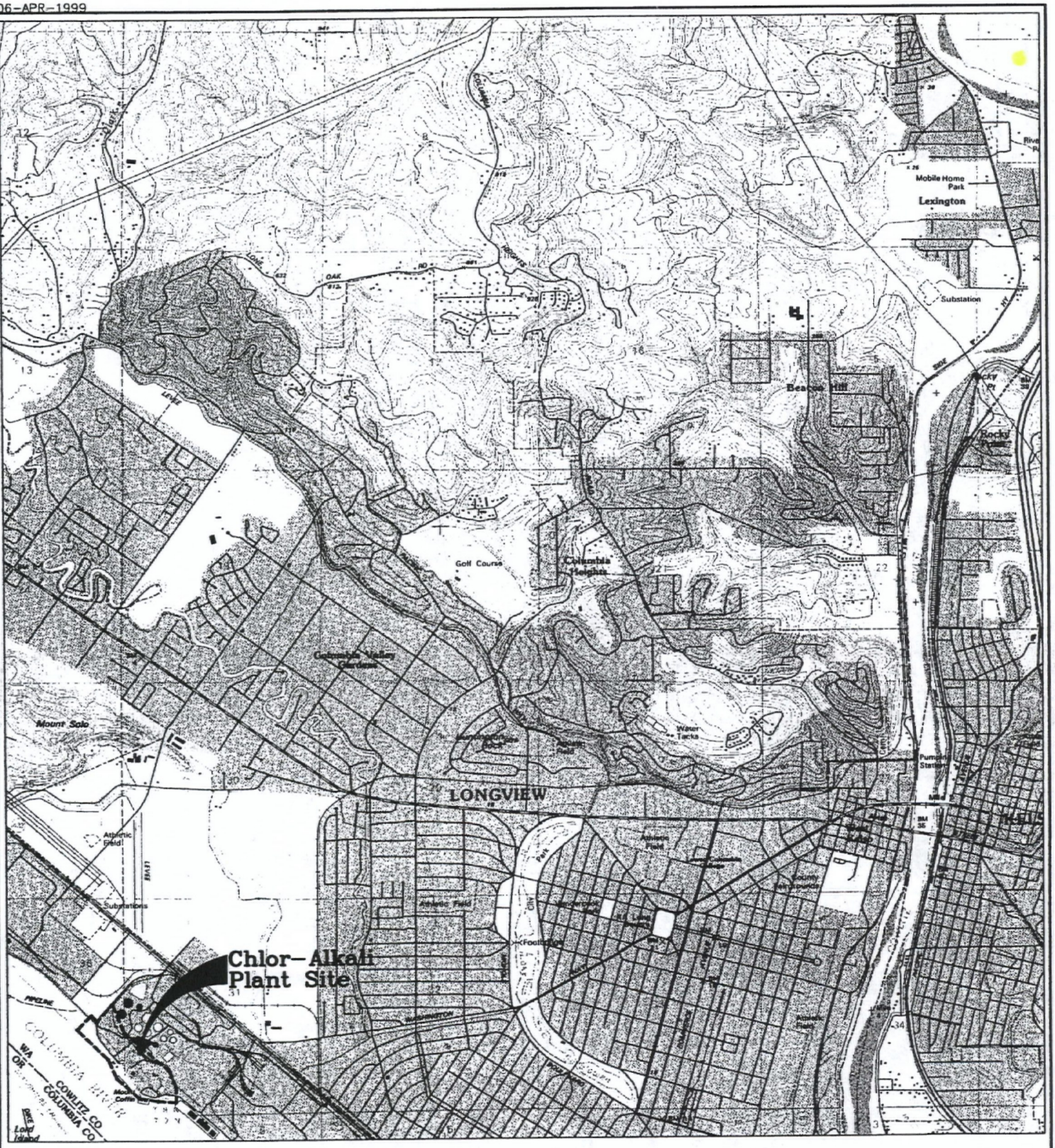
Based on the results and evaluations presented in this report, the feasibility study will establish remedial action goals and remediation levels (that is, concentrations above which remedial action may be required) for soil to protect groundwater from a rising water table and for groundwater, taking into account its current and future use. The establishment of remediation levels may result in an evaluation of soil and groundwater remedial alternatives.

TABLE ES-1
CULs Used for the Chlor-Alkali Plant

Medium	Pathway	CUL	Source
Onsite Soil	Direct contact by humans	1,050 mg/kg	CLARC II
Onsite Soil to Protect Groundwater	Ingestion by humans	1.05 mg/kg	WAC 173-340-745 Table 3
Onsite Groundwater	Ingestion by humans	2 µg/L	CLARC II (MCL as ARAR)
Sediment (Columbia River)	Effect levels for benthic organisms	0.2-2.0* mg/kg	Ontario Sediment Standards
Sediment (Columbia River)	Accumulation into fish	0.61* mg/kg	Ecology Sediment Quality Criterion
Surface Water (Columbia River)	Acute exposure to aquatic organisms	2.4 µg/L	State of Washington AWQC
Surface Water (Columbia River)	Chronic exposure to aquatic organisms and subsequent users	0.012 µg/L	State of Washington AWQC
Fish Tissue	Food-chain transfer; consumption by recreational anglers	1 mg/kg	U.S. Food and Drug Administration Action Level

*A promulgated MTCA CUL for sediment is not currently available. Values listed are selected as alternate comparison criteria.

06-APR-1999



LEGEND

Approximate Site Boundary

0 1000 2000

SCALE IN FEET

FIGURE ES-1

Location Map

WEYERHAEUSER CHLOR-ALKALI PLANT
LONGVIEW, WASHINGTON

CH2MHILL

P:\WEYERHAS\CAD\8834s16A.dwg

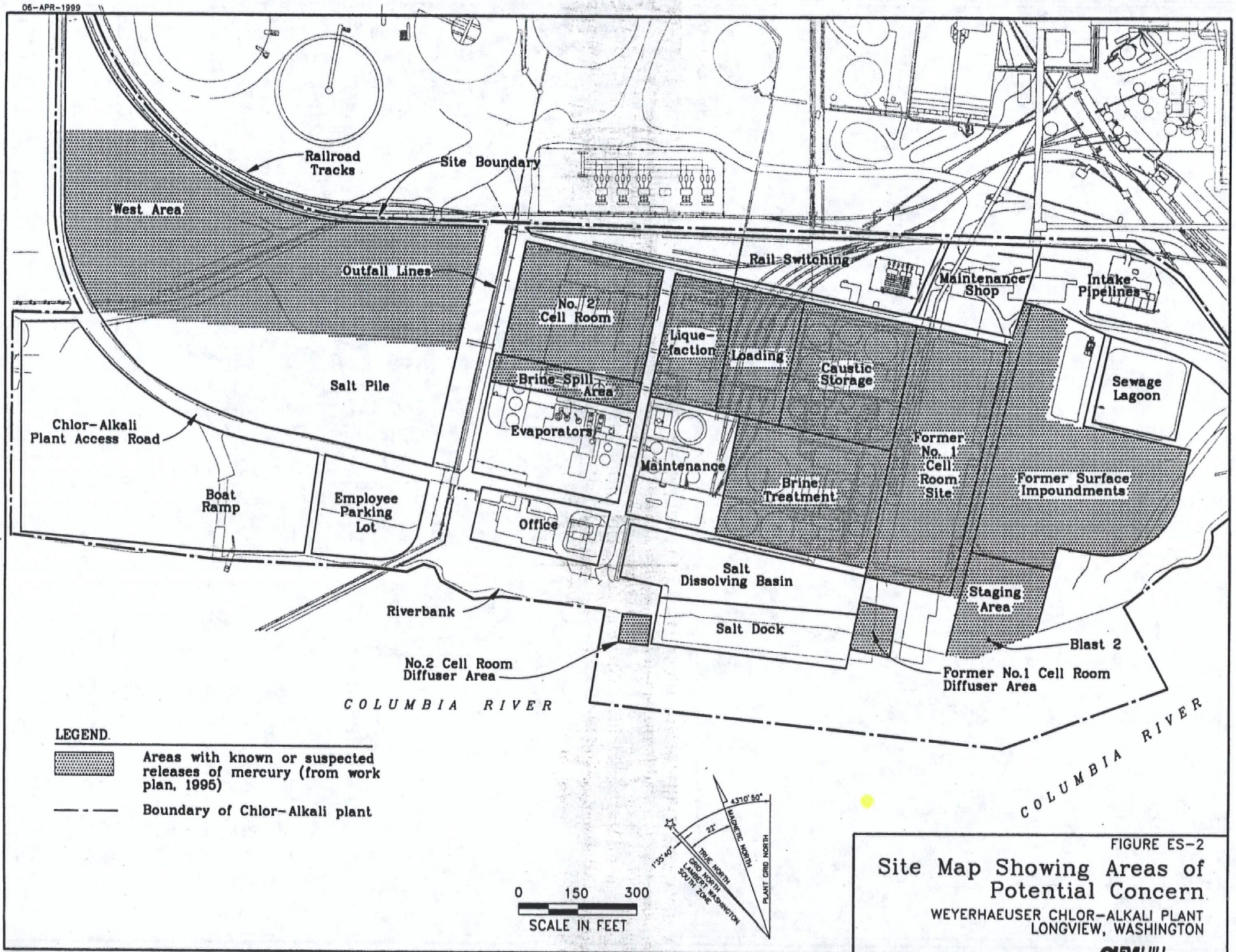


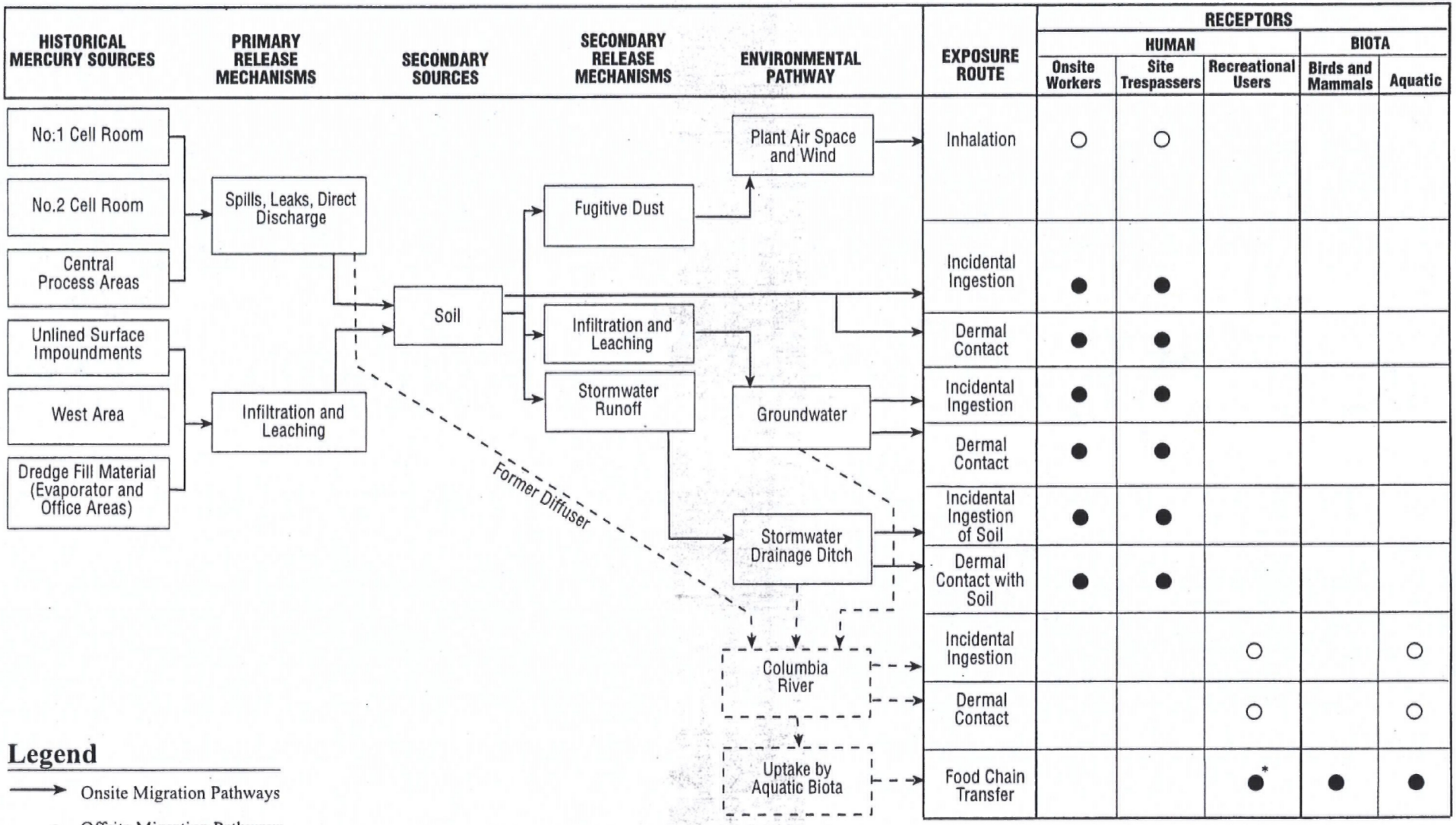
FIGURE ES-2

Site Map Showing Areas of Potential Concern

WEYERHAEUSER CHLOR-ALKALI PLANT
LONGVIEW, WASHINGTON

CHEMHILL

8834q018.DWG



* It is reasonable to conclude that there is no subsistence fishing on the Columbia River (Section 5.2.5)

FIGURE ES-3

Conceptual Exposure Model for the Chlor-Alkali Plant

WEYERHAEUSER CHLOR-ALKALI PLANT
LONGVIEW, WASHINGTON

SECTION 1

Introduction

1.1 Purpose of RI Report

This remedial investigation (RI) report has been prepared by CH2M HILL on behalf of Weyerhaeuser Company, which owns and previously operated a Chlor-Alkali Plant at its forest products complex in Longview, Washington. On March 15, 1999, Weyerhaeuser shut down the chlorine production at this facility. Following decommissioning activities, the plant will be put into mothball status. No decisions about the long-term use of the site have been announced.

The location of the Chlor-Alkali Plant is shown in Figure 1-1. Chlorine and caustic were initially produced at the plant using the mercury electrolytic cell process in the late 1950s to the mid-1970s. In the 1970s, concerns over potential releases of mercury into the environment prompted Weyerhaeuser to change its methods of handling process wastes and to convert to a different process technology (diaphragm cells). By 1976, mercury was no longer used at the plant. As a result of past practices, Weyerhaeuser implemented a program of sampling various media to determine mercury concentrations. From the early 1970s to the mid-1990s, Weyerhaeuser conducted remediation of materials at the Chlor-Alkali Plant that contained mercury.

This RI report presents the findings of past and current sampling work performed according to requirements of the January 1996 Model Toxics Control Act (MTCA) (Washington Administrative Code [WAC] 173-340-350). This remedial investigation is being undertaken as an independent action and is based on a work plan prepared by CH2M HILL and approved by the Washington Department of Ecology (hereafter referred to as Ecology) in 1998. It is anticipated that Weyerhaeuser and Ecology will enter into an Agreed Order in 1999 for a feasibility study and any potential remedial action.

Potential areas of concern (see Figure 1-2) were identified in the approved work plan (CH2M HILL, 1995). Because there is a considerable amount of data available on plant operations, site conditions, and mercury concentrations, as documented in the approved work plan (CH2M HILL, 1995), an extensive site investigation during the RI was unnecessary. Sampling conducted at the site in the potential areas of concern has been comprehensive and provides a firm basis for remedial decisionmaking. Because much of the information required for the RI/FS by MTCA is already included in the work plan, the objectives of the RI report are focused on the following, per WAC 173-340-350 (1) :

- To present the information collected during the RI
- To determine the extent and concentration of mercury in soil, groundwater, surface water, and sediment
- To evaluate the risk to receptors identified in the approved work plan

- To provide information necessary to determine the need for additional remedial measures and to enable the selection of a cleanup action under WAC 173-340-360.

Table 1-1 presents the requirements of MTCA (WAC 173-340-350) and the document that includes (or, in the case of the feasibility study, that will include) the required information. Table 1-1 shows that the majority of the information required by MTCA was included in the work plan (CH2M HILL, 1995).

1.2 Report Organization

The report is organized into the following main sections:

- **Section 1: Introduction.** This section describes the purpose of the RI report and its organization and presents background information, a brief site history, and tables showing WAC requirements and summarizing major events in the history of the site.
- **Section 2: Study Area Investigation Activities.** This section describes the methods and extent of the 1998-1999 RI fieldwork. The locations and types of samples are discussed.
- **Section 3: Physical Site Conceptual Model.** This section summarizes the geology, groundwater, and surface water quality information for the Chlor-Alkali Plant.
- **Section 4: Nature and Extent of Mercury.** This section discusses the nature and extent of mercury contamination in soil, sediment, groundwater, and surface water and presents the mercury conceptual model.
- **Section 5: MTCA Cleanup Level Comparison.** This section presents the conceptual site model for exposure pathways and receptors, evaluates MTCA cleanup levels, compares cleanup levels to site data, and summarizes the risk associated with mercury at the Chlor-Alkali Plant.
- **Section 6: Conclusions.** This section presents the conclusions of the remedial investigation. These conclusions will provide the basis for the feasibility study.
- **Section 7: Works Cited.** This section presents an alphabetical summary of reference documents used in this RI report.

1.3 Background Information and Brief Site History

The site is located on the north shore of the Columbia River near the city of Longview, in Cowlitz County in southwest Washington (see Figure 1-1 for the location of the Chlor-Alkali Plant). The plant site is flat and overlies a remnant of Mount Coffin, an isolated basalt erosional peak that was removed as part of site development. The subsurface consists of alluvium and basalt. Both surface water and groundwater from the site flow toward the Columbia River. A summary of major activities at the site is presented in Table 1-2.

In the mid-1950s, Weyerhaeuser Company began production of chlorine and caustic for its pulp and paper mills. Construction of the Chlor-Alkali Plant in Longview began in 1956.

Facility operations, including those of the former No. 1 Cell Room, commenced in the fall of 1958. The former No. 1 Cell Room was constructed above the remnant of Mount Coffin, an approximately 300-foot-high basalt promontory. The plant was expanded in 1966 with the addition of a second cell room (the No. 2 Cell Room) and a liquefaction building.

The technology that was available and used at this time (the late 1950s) to produce chlorine and caustic was the mercury electrolytic process. This two-part process used a brine electrolyzer and an amalgam decomposer. Leaks from pumps, valves, and process lines from the former No. 1 Cell Room have resulted in mercury releases to onsite soils. The potential for mercury releases from the No. 2 Cell Room was considerably lower than from the former No. 1 Cell Room because of differences in building construction and the duration of process operations. Environmental control systems for the plant were put into place in the 1970s. In the mid-1970s, the mercury electrolytic chlorine and caustic production cells were replaced with diaphragm cell technology. This change-out effectively ended the production-related loss of mercury to the environment.

The mercury that was released more than 20 years ago is currently detectable in soil and groundwater, and several removal actions have taken place to remove the highest mercury concentrations in soil at the plant. Groundwater at the plant, which discharges into the Columbia River, has been monitored since 1987. Surface water, sediments, and fish in the Columbia River have been monitored for mercury since the 1970s. Currently, mercury concentrations in the river near the plant are similar to mercury concentrations upstream and downstream of the plant.

The Chlor-Alkali Plant is currently listed on Ecology's Hazardous Waste Site List (which is found within the site register for the Toxics Cleanup Program), based on past reviews by Ecology and submittals by Weyerhaeuser. A work plan for a remedial investigation and feasibility study for mercury in the environment at the Chlor-Alkali Plant (CH2M HILL, 1995) was submitted to Ecology and approved in 1998.

The remedial investigation fieldwork has been completed at the plant as an independent action by Weyerhaeuser. This work has involved collecting samples as prescribed in the approved work plan, and this RI report has been prepared. The next phase of this work will be the preparation of a feasibility study to address mercury present in the environment.

Additional information about the site history (particularly details on regulatory history and investigations prior to 1998) is available in the approved work plan (CH2M HILL, 1995).

TABLE 1-1
Comparison of WAC Requirements to Reports

Requirement (WAC-340-350)	Approved Work Plan	Remedial Investigation	Feasibility Study
1. Purpose	--	X	--
2. Timing	X	X	--
3. Administrative Options	X (a)	X (a)	X (b)
4. Public Participation	--	--	X
5. Scope	--	X	X
6. Contents			
a. General Facility Information	X	--	--
b. Site Conditions Map	X	--	--
c. Field Investigations	X	X	--
i. surface water and sediments	X	X	--
ii. soils	X	X	--
iii. geology and groundwater	X	X	--
iv. air (c)	NA	NA	NA
v. land use	X	--	--
vi. natural resources and ecology	X	--	--
vii. hazardous substance sources	X	X	--
viii. regulatory classifications	X	--	--
d. Risk Assessment	--	X	--
e. Cleanup Action Alternatives	--	--	X
f. Work Plans	X	--	--
g. Treatability Studies (f)	NA	NA	X
h. State Environmental Policy Act	X	--	--
i. Other Information (d)	X	X	X
7. Departures from Section 6 (e)	NA	NA	NA
8. Report	X	X	X

Notes:
(a) Independent action.
(b) Anticipated Agreed Order.
(c) Air not include in scope of work because buildings were enclosed and vents had scrubbers, per approved work plan.
(d) Other information required by Ecology. None identified.
(e) None identified.
(f) If warranted
-- = Included in other document.
NA = Not applicable.
X = Requirement addressed in this report.

TABLE 1-2
Summary of the Major Events in the Site History

Event	Date
Site History	
Mount Coffin leveled	1940s-1950s
Former No. 1 Cell Room built (used the mercury cell process)	1958
No. 2 Cell Room built (used the mercury cell process)	1966
Direct discharges of aqueous process waste to Columbia River ceased	1970s
Surface impoundments remediated	1972-1977
No. 2 Cell Room switched to diaphragm cells	1975
Surface impoundments no longer in use	1976
Chlorine production ceased in the former No. 1 Cell Room	1976
Eruption of Mt. St. Helens and subsequent dredging	1980s
Former No. 1 Cell Room demolished	1991
No. 1 Diffuser in Columbia River removed	1992
Shutdown of chlorine production	March 1999
RI/FS Process	
Site ranked on Hazardous Sites List	1985
Work plan submitted	May 1995
Work plan approved, implemented	June 1998
Draft RI report submitted	April 1999

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

August 5, 1999

Mr. John P. Gross
Senior Environmental Manager
Weyerhaeuser
CH 1K29
P.O. Box 2999
Tacoma, WA 98477-2999

RE: Remedial Investigation Report – Chlor-Alkali Plant, Longview, Washington

Dear Mr. ~~Gross~~ John:

This letter serves as the Department of Ecology's (Ecology) comment upon and approval of the Remedial Investigation Report (RI) for Weyerhaeuser's Longview Chlor-Alkali Plant.

The RI is, Ecology believes, well done and a credit to your company and consultants who produced it. Comments are as follows:

1. Section 5.2.3 Transport Pathways discusses the likelihood of mercury transport being controlled by ground water levels and flux rather than the infiltration of meteoric water through the soil column. This section concludes in part, "...it is most likely that the major source of mercury in ground water is from isolated mercury globules present within the [bedrock] basalt fractures and not from mercury currently present in soil."

   This statement seems at odds with data and evidence presented elsewhere in the RI which indicates a different conclusion. Comprehensive soil sampling data show a varying degree of residual mercury in soils around the site. Average mercury concentrations range from lows of 2-3 mg/kg (West Area, Liquefaction and Loading Areas) to highs of 46-54 mg/kg (No. 1 Cell Room Site and Brine Spill Area).

   Earlier in the RI, Section 4.3.3 estimates mass flux of mercury from the site from two ground water sub-pathways: an alluvial aquifer discharge, and basalt zone discharge. The RI models ground water Mercury transport and estimates 1998 loading to the Columbia River to be approximately 0.62 pound per year and 0.0002 pound per year respectively from these two pathways. The section then concludes: "The total mercury discharge for both groundwater

zones, therefore, was approximately 0.6 pound (0.28 kilogram) in 1998. Because of its low permeability, *the basalt zone contributes a negligible fraction of this total.*" (Emphasis added)

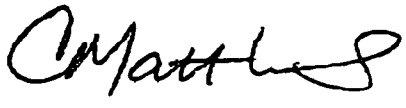
The contribution to ground water loading by residual mercury trapped in the basalt is difficult to model and quantify. The RI, nevertheless, has acknowledged and considered the problem, deriving the approximate annual loading numbers. With this work and other information and data presented in the RI, it seems more likely that the major controlling factor for mercury in ground water is the presence of widely distributed residual contaminant in remaining site soils and the flux of ground water levels (not meteoric infiltration) through them.

2. Section 5.4.6 summarizes the MTCA cleanup level comparisons and probable focus for a Feasibility Study (FS) based on the work presented in the RI. This section concludes: "Based on the results from sediment, surface water, and fish tissue, these media will not be addressed in the Feasibility Study."

   Ecology believes this RI to be thorough, well done, and agrees with most conclusions presented in it. However, it may be premature with this letter to rule out all future work on these media. As you know, the US EPA (EPA) has classified this site as "potentially eligible" for National Priority listing and is involved in oversight to some degree of this project. Ecology recommends EPA concurrence with these conclusions before flatly ruling out further consideration of these media.

Thank you for the opportunity to review and comment upon this work. Please call me if you have questions regarding this letter or Ecology's involvement with this project.

Sincerely,



Cris Matthews
Regional Hydrogeologist
Solid Waste & Financial Assistance Program

cc: Anne Bolling, CH2M Hill
Monica Tonel, US EPA Region 10